

Identifying Recommendations for Occupancies on Guam to Maintain Fire Code Requirements
after Initial Fire Code Inspections by the Guam Fire Department

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Abstract

Examination of Guam Fire Department fire inspection reports indicated a high percentage of existing occupancies and businesses were in violation of fire and life safety code requirements. The problem is many of the occupancies on Guam do not maintain fire code requirements after their initial Guam Fire Department (GFD) fire code inspections. The purpose of this research is to identify recommendations for occupancies on Guam to maintain fire code requirements after initial fire code inspections by GFD. The Descriptive Research Method was used to answer the following research questions: (a) How are other fire departments in other communities having their occupancies maintain fire code requirements?, (b) What are the occupancies on Guam that are problematic and not maintaining fire code requirements?, (c) Why are occupancies on Guam not maintaining fire code requirements?, and (d) What violations are more likely to occur than others? The procedures this researcher conducted included reviewing and compiling data from GFD Fire inspection reports; conducting interviews with various stakeholders on Guam; utilizing questionnaires to acquire data from fire departments throughout the United States; and reviewing literature regarding code enforcement and compliance. Recommendations were made to increase compliance for occupancies on Guam after the initial fire code compliance inspection. These recommendations included: First, this researcher recommends that the Guam Fire Department increase its presence in the community with the use of Fire Suppression Personnel for fire code inspections; second, recommend an increase in a public education campaign with the use of government agencies and private organizations; third, recommend a more aggressive campaign for citing and imposing fines for repeat violators of the fire code; and fourth, recommend a requirement for all occupancies to have an annual clearance from the Guam Fire Department Fire Prevention Bureau for business license renewals.

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INTRODUCTION

The Guam Fire Department (GFD) Fire Prevention Bureau (FPB) conducted 986 fire inspections from January 1, 2012 through July 31, 2012 (Guam Fire Department Fire Prevention Bureau, 2012). Examination of these fire inspection reports indicated a high percentage of existing occupancies and businesses were in violation of fire and life safety code requirements. The problem is many of the occupancies on Guam do not maintain fire code requirements after their initial Guam Fire Department (GFD) fire code inspections.

The purpose of this research is to identify recommendations for occupancies on Guam to maintain fire code requirements after initial fire code inspections by GFD. This researcher will utilize the Descriptive Research Method and will answer the following research questions: (a) How are other fire departments in other communities having their occupancies maintain fire code requirements?, (b) What are the occupancies on Guam that are problematic and not maintaining fire code requirements?, (c) Why are occupancies on Guam not maintaining fire code requirements?, and (d) What violations are more likely to occur than others?

BACKGROUND AND SIGNIFICANCE

Guam was ceded to the United States by Spain in 1898 and is one of the most strategically important US bases in the Pacific ("Guam," 2012, p. 1). Guam is an unincorporated territory of the United States. In August 1, 1950, President Harry S. Truman signed H.R. 7273 into law as the Organic Act of Guam establishing civilian government (Rogers, 1995, p. 222).

According to the US Census, Guam has a population of 159,358 (US Census Bureau, 2011, para. 1). Additionally, Guam has a large number of visitors every year. The *Pacific Daily News* reported that the total visitor arrival count for FY2011 on Guam was 545,654 (Miculka,

2012, p. 12). The majority of these visitors come from Japan, Korea, and other parts of Asia. A large number of military visitors also arrive on Guam throughout the year in support of various military exercises and deployments in the region.

Guam's economy primarily depends on the tourism industry and the U.S. military presence on the island. According to the General Licensing & Registration Branch of Guam Department of Revenue and Taxation, Guam had a total of 19,638 business licenses registered for FY2011 (General Licensing and Registration Branch, Guam Department of Revenue and Taxation, 2011, p. 1). This number of registered licensed businesses does not include certain occupancies such as educational, places of worship, and many public sector occupancies which the FPB are required to inspect for fire code compliance. Other industries such as construction, services, and communications directly or indirectly support these governments operations and the tourism industry. These industries, both public and private sector, have to be regulated and inspected for life safety and fire code compliance by the GFD FPB.

The local, military, and federal government employs a significant amount of the workforce on Guam. However, the private sector employs the majority of the Guam workforce. According to a report prepared for the First Hawaiian Bank, "the private sector has provided approximately 75% of employment on Guam with 18%-20% provided by the local government and 5%-6.5% by the Federal government" (Ruane, 2012, p. 2).

The Fire Service history on Guam dates back to the early 1900's under U.S. Naval Government. In 1925, H.B. Price, U.S. Naval Governor of Guam issued fire regulations which covered fire prevention and fires for the island of Guam (Price, 1925, p. 81). These fire regulations were enforced by the Fire Marshal of the United States Naval Government who was assisted by members of the Fire Department or Insular Patrol (Price, 1925, p. 83-84). Violations

of these regulations were assessed a fine not to exceed \$100 or 90 days imprisonment (Price, 1925, p. 84). Today, Fire Code Enforcement on Guam is based on the *2009 INTERNATIONAL FIRE CODE* (2009 IFC) which was signed into Public Law 30-199 on September 21, 2010 by Felix P. Camacho, Governor of Guam (Camacho, 2010, Governor of Guam to Speaker of Guam Legislature, September 21, 2010). The newly adopted 2009 IFC was not to be effective till January 1, 2011. For the next four months after the adoption of the 2009 IFC, the GFD FPB prepared for the transition from the *1997 Uniform Fire Code* to the 2009 IFC.

The GFD Fire Prevention Bureau consists of four main sections: Fire Code Enforcement, Plans Review, Public Education, and Fire/Arson Investigation (Taijeron, 1986, para. 605). The GFD FPB is responsible for conducting fire code and life safety inspections for the majority of local occupancies excluding military bases, and federal buildings in the Territory of Guam. Guam has a wide range of occupancy types to include airports, seaports, hotel and business high-rises, shopping malls, hospital, colleges, schools, as well as residential housing developments. In 2011, the FPB conducted a total of 1,677 fire inspections, 219 plan reviews, and 59 fire investigations (Guam Fire Department Fire Prevention Bureau, 2011, p. 1).

All personnel assigned to the FPB are graduates of the Guam Fire Academy and have experience in Fire Suppression, Emergency Medical Services, as well as the other functions of the Guam Fire Department. Other than the required GFD Fire Academy, FPB training was limited in the past to on-the-job training (OJT) with some FPB members receiving training at the National Fire Academy.

Currently a total of 12 uniformed personnel are assigned to the FPB. Performing and executing tasks associated with the FPB has been challenging due to staffing shortages and government budget cuts. Personnel assigned to the FPB are required to multi-task among the

four FPB sections. Work and task assignments are based on individual training, experience, and physical abilities. As a result of the shortage of personnel assigned to the FPB and the number of occupancies on Guam, FPB inspectors have not been regularly inspecting existing occupancies after their initial fire code inspection.

In 1998 the 24th Guam Legislature approved a fines schedule for violations of the Guam Fire Code (24th Guam Legislature, 1998, p. 1). Due to administrative and technical issues, it was not until June of 2012 did the FPB start issuing fines for violations of the Fire Code. In 2007 the 29th Guam Legislature approved a fee schedule for services provided by the Guam Fire Department to include inspections and permitting services (29th Guam Legislature, 2007, p. 70). It was not until 2008 did the FPB start charging for fire inspections and permitting services due to administrative and technical difficulties.

This ongoing applied research project will have a significant impact on the way the FPB conducts business. Because of the high percentage of existing occupancies not maintaining fire code requirements after the initial fire inspections, it is important that the GFD FPB address these issues and come up with recommendations to minimize this hazard in the community. This applied research project has required this researcher, who is currently assigned as the Fire Marshal, to re-evaluate GFD FPB's practices and procedures.

This research supports the importance of data collection and interpretation. Additionally, this applied research project is directly related to the National Fire Academy's *Executive Development* Course in that the Guam Fire Department Fire Prevention Bureau and the community of Guam are faced with an "adaptive challenge" (Heifetz & Linsky, 2002, p. 13) which requires a change in the way we think and a change in values and behaviors. Addressing

“adaptive challenges” is an important part of leadership and executive development. This research supports the intent of the *Executive Development* course by requiring the fire officer to conduct research, develop and exercise leadership, while addressing change and an “adaptive challenge.”

This research project also supports the United States Fire Administrations (USFA) “strategic goals” as identified in the USFA’s Strategic Plan of “reducing risk at the local level through prevention and mitigation” (United States Fire Administration, 2010, p. 13). By clearly identifying the shortfalls of fire prevention in our community, the Guam Fire Department can better serve the people of Guam. The information gained will assist the Guam Fire Department in identifying recommendations to reduce the risk of fire and life safety hazards at the local level. This research will also be utilized for departmental planning and budgeting justification.

LITERATURE REVIEW

This researcher will focus the literature review on this applied research projects four research questions: (a) How are other fire departments in other communities having their occupancies maintain fire code requirements?, (b) What are the occupancies on Guam that are problematic and not maintaining fire code requirements?, (c) Why are occupancies on Guam not maintaining fire code requirements?, and (d) What violations are more likely to occur than others?

How Fire Departments Are Maintaining Fire Code Requirements

Many fire departments throughout the world use the National Fire Protection Association’s, *Fire Protection Handbook* for guidance on fire prevention. Discussed in the *Fire Protection Handbook* are “two major components” for “community risk reduction” (Kirtley, 2008, p. 12-310). Stated are, “the use of the five “E”s and engaging the community” (Kirtley,

2008, p. 12-310). These five “E”s include, “education, enforcement, engineering, emergency response, and economic incentives” (Kirtley, 2008, p. 12-310). “The second component of community risk reduction is engaging the community, especially the groups that are mostly likely to be negatively impacted by the risk(s)” (Kirtley, 2008, p. 12-312). This concept is utilized throughout the fire service to include the Guam Fire Department. The model of the Guam Fire Departments organizational structure involves many aspects of the five “E”s to include the Fire Suppression Bureau, Fire Prevention Bureau, EMS/Rescue Bureau, and a Training Bureau. However, execution of all tasks involved with these various bureau functions have been challenging due to budget cuts and an economic depression that the island faces.

“Unwanted fires have a monetary impact on communities because fires remove businesses from the tax rolls while the damaged building is rebuilt and reconstructed” (Stookey, 2010, p. ix). If businesses fail to maintain fire code requirements, they eventually may become a victim of a fire. This will not only affect these businesses ability to pay taxes, it will also affect the ability of the business owner to pay their employees. These fires cause an economic chain reaction, especially in communities with fragile economies and high unemployment rates like Guam. “The latest unemployment data from the Guam Department of Labor show a rate of 13.3% in March 2011, well above U.S. (8.6%) and Hawaii (6.3%) rates at the time” (Ruane, 2012, p. 2). Along with the business owners, the employees may become victims of the fire. “Statistics confirm that over 40% of the businesses that experience a fire never reopen because they lose their customer base” (Stookey, 2010, p. ix). The worst tragedy involved with a fire is the loss of human life. One of the primary missions of the Guam Fire Department and the Fire Service throughout the nation is to prevent and minimize the causes of fires. One of the ways that the fire service does this is through the adoption of fire codes.

In order for a jurisdiction to enforce a fire code or require a community to comply with a fire code, the fire code must first be legally adopted into law. Communities throughout the nation adopt model codes. “Model codes are nationally recognized regulations that address the design, construction, operations, and maintenance of buildings, uses, and hazards that are maintained and updated through an open and accessible code development process” (Stookey, 2010, p. 15).

After the model code is adopted, most jurisdictions enforcing the fire code implement various programs for inspections, permits, fees, and citations. Inspections are necessary to ensure compliance with the fire code. Inspections could also involve testing and verifying that fire protection systems are operational. “The fire codes place the responsibilities of the proper installation of any required fire protection, life safety, or hazardous materials storage and use systems in the hands of the registered design professional or installing contractor” (Stookey, 2010, p. 31). Additionally, model codes provide the requirements and direction for professional contractors, and designers in regards to fire and building safety. The codes provide the legal authority for fire service inspectors to enforce the codes and ensure compliance with life and fire safety requirements. Under the administration portions of these model codes defines the intent and purpose. The *2009 International Fire Code* which the Guam Fire Department enforces states:

101.3 Intent. The purpose of this code is to establish the minimum requirements consistent with nationally recognized good practice for providing a reasonable level of life safety and property protection from the hazards of fire, explosion or dangerous conditions in new and existing buildings, structures and premises and to provide safety to

fire fighters and emergency responders during emergency operations. (International Code Council, 2009, p. 1)

Citations and fines are a useful tool in gaining compliance. Failure to comply with fire code requirements may result in a fine or citation. “In some jurisdictions, violations are criminal misdemeanors and inspectors are empowered to issue **summonses** or **citations** for violations of the fire prevention code” (Diamantes, 2003, p. 28). As mentioned earlier, only as recently as June of 2012 did the GFD FPB begin issuing citations for violations of the Guam Fire Code. Many businesses, building owners and tenants on Guam do not know that a fine may be imposed for violations of the fire code. Occupancy owners are now becoming aware of the penalties for violations of the fire code on Guam.

The fines imposed for violations of the fire code that jurisdictions charge throughout the nation vary. GFD FPB charges \$75 per violation and up to \$1,000 for non-compliance of FPB fire code orders (24th Guam Legislature, 1998, p. 3 - 8). Non-compliance in Honolulu, Hawaii can result in prosecution with a fine of up to \$1,000 (Bratakos, 2012, p. 1). Some jurisdictions such as San Ramon Valley Fire Protection District, California use the option to charge a re-inspection fee or issue an “Administrative Citation” as a penalty for failing an inspection (Jamison, 2012, p. 2).

Many times the focus after adopting codes is on the fire inspector and their ability to conduct fire code inspections. It is also equally important for fire companies to be aware of fire code violations and the potential life safety hazard that may develop if unreported. These potential fire and life safety hazards are not only a threat to the public but also to the responding fire fighters. An article in the *INTERNATIONAL FIRE SERVICE JOURNAL OF LEADERSHIP*

AND MANAGEMENT made recommendations for risk management in pre-incident planning such as facilitating the reporting of code violations observed by fire fighters and enforcing building codes in an effort to reduce fire fighter line of duty deaths (Moor-Merrell, Zhou, McDonald, Fisher, & Moore, 2007, p. 21). “The participation of fire suppression personnel in fire prevention activities is as necessary as their participation in tactical operations” (Carter & Rausch, 1999, p. 120). “Fire department personnel are the logical resources for fire prevention efforts, when they are not occupied with responses to incidents and related activities” (Carter & Rausch, 1999, p. 120).

Public Education is another tool in which departments across the nation have been using to gain compliance. The Fire Marshal from Pitman Fire Department, Pitman, New Jersey works with the local Chamber of Commerce and Economic Development Committee to provide public education on fire code issues and also to provide input on proposed projects (Pierson, 2012, p. 2).

Every year during the month of October fire departments throughout the nation promote Fire Prevention Week within their respective jurisdictions. These activities on Guam, although meant for the entire community, mainly target the school children. Pamphlets and information are given to the children at various schools throughout Guam who bring this information home to the families. However, this type of public education campaign conducted by the FPB is done primarily during the month of October and not throughout the year due to staffing shortages and other tasks required such as fire inspections, plan reviews, and fire investigations. “Thinking long term, we need to begin shifting our educational efforts from strictly reactionary behavior messages (what to do if fire occurs), to prevention messages that give people knowledge, skills, or both to prevent fires” (Nachbar, 1995, p. 1092).

The United States Fire Administration's report *America at Risk* indicated that, "The reduction of the number of fire deaths since the first America Burning report is due to a number of factors, including increased awareness that fire is not an inevitable tragedy" (United States Fire Administration, 2000, p. 24). The *America at Risk* report also stated that:

"A public education approach should be mindful of two essential elements: first, the public education must make the target audience aware of the hazards on both an intellectual and emotional level. Second, the target audience must receive and accept the message that the hazard or problem is within its control" (United States Fire Administration, 2000, p. 24).

The commission in the *America at Risk* report also made recommendations to develop a public education campaign with features such as: results, goals, and objectives that were measurable; concentrating messages to high risk areas; training fire officers in media relations; and a multi-hazard public education regarding code enforcement, construction standards, sprinklers and smoke detectors (United States Fire Administration, 2000, p. 24)

Training of fire service personnel to effectively conduct duties related to fire prevention is important to all fire departments. It is important for consistency and credibility. Training may consist of on-the-job training (OJT), fire academies, or the local community college. Many departments take advantage of training opportunities at the National Fire Academy, Maryland. Some states adopt fire inspector certification requirements while others utilize their fire department policies and procedures. On July 2012, the GFD Fire Marshal adopted the use of NFPA 1031 as guidelines for Fire Inspector training. NFPA 1031 specifies minimum job requirements for fire inspectors and plan examiners (National Fire Protection Association

[NFPA], 2008, p. 5). The importance of fire inspector training cannot be neglected. However, is the inspector's style of enforcement just as important?

One such study was conducted on whether "enforcement style" of building inspectors may play a role in gaining regulatory compliance (May & Wood, 2003). Inspectors are described as "classic examples of street level bureaucrats" (May & Wood, 2003, p. 117). May & Wood (2003, p. 119) defined "enforcement style as the character of the day-to-day interactions of inspectors when dealing with representatives of regulated entities." According to May & Wood (2003, p. 119) styles vary from "acting like consultants-using a friendly, facilitative approach-to acting like cops-using a more reserved, legalistic approach."

The regulatory setting for their study on enforcement style was the regulation of building safety of new homes (May & Wood, 2003, p. 121). The data they collected was based on surveys mailed to sample homebuilders in 2000 (May & Wood, 2003, p. 122). Variables studied were compliance with building codes, home builder's knowledge of codes, and degree of cooperation between the inspectors and home builder's (May & Wood, 2003, p. 123).

May and Wood (2003, p. 134) "failed to detect a noteworthy effect of inspectors' enforcement styles on regulatory compliance." May and Woods (2003, p. 135) did state that their "findings do not suggest that inspection is unimportant or that inspectors' actions in leveling fines or warnings are ineffective." They further stated that the inspection process is viewed by both the inspector and the homebuilder as a form of quality control (May & Wood, 2003, p. 135).

In summary, fire departments and communities use a variety of ways to have occupancies maintain fire code requirements. These include public education, the adoption of model codes,

through the use of citations and fines for violations, and through effective fire inspections. Additionally, maintaining close networks with local civic groups and reporting of fire hazard and code violations observed by fire companies during pre-incident planning and emergency response is also another means of maintaining fire code requirements. Proper training is important in gaining compliance and gaining credibility. One study found that although enforcement styles do not have a noteworthy effect on compliance, the inspection process is viewed as a form of quality control by both building owners and inspectors (May & Wood, 2003).

Problematic Occupancies

From January 1, 2012 through July 31, 2012 a total of 87 inspections of existing occupancies were inspected with 79% of these inspections failing fire code requirements (Guam Fire Department Fire Prevention Bureau, 2012). Of these problematic inspections, 51% were assembly occupancies with the majority being restaurants not maintaining commercial cooking extinguishing systems (Guam Fire Department Fire Prevention Bureau, 2012). Other types of existing occupancies found to be problematic were business offices, stores, and the hotels (Guam Fire Department Fire Prevention Bureau, 2012).

This researcher over the past years has been involved with annual fire and safety inspections of the Guam public schools. These schools have had a problematic history maintaining fire code requirements, especially in the area of fire protection systems mainly due to financial and budgetary constraints. In 2008, Guam Attorney General Alicia Limtiaco formed the Guam Public School System Health and Safety Task Force “to address health and safety concerns in the school system that were brought by members of the community” (Guam Office

of the Attorney General, 2008, p. 17). The task force included members of the Attorney General's Office, Guam Fire Department, Guam Public Health, and Guam Environmental Protection Agency. As a result of inspections conducted by the task force, six schools were closed and others partially closed after being deemed unsafe (Guam Office of the Attorney General, 2008, p. 18). Most of the schools were placed on fire watch by the Guam Fire Department pending completion of repairs and/or replacement of broken or inoperable fire protection systems.

Recently, the Guam public school system has been actively working and attempting to comply with fire code requirements and orders. Fire protection contractors and designers representing the public schools on Guam have submitted numerous fire alarm drawings for plans review to the FPB for approval (Guam Fire Department Fire Prevention Bureau Plans Review Section, 2012).

In summary, review of fire inspection reports reviewed from January 1, 2012 through July 31, 2012 indicated that the most problematic of the existing occupancies that failed were the restaurants, business offices, stores, and hotels. Public schools on Guam have also had a problematic history of not maintaining fire protections system such as portable fire extinguishers, fire alarms, sprinklers, and commercial cooking, extinguishing systems.

Why Occupancies Are Not Maintaining Fire Code Requirements

Although Guam statutes require occupancies to maintain fire code requirements, many do not. This researcher has participated in many fire code inspections and the most common replies from building owners and tenants are that they did not know the requirements. In a one month random survey conducted by the FPB to applicants for fire inspections, revealed that many of the

applicants did not know how to check their smoke detectors, portable fire extinguishers, and basic fire safety knowledge (Guam Fire Department Fire Prevention Bureau, 2012). Lack of knowledge of fire code requirements may not be the only reason for not maintaining fire code requirements.

Many of the owners of the existing occupancies that failed fire inspections basically say during the inspection that maintaining fire safety was too expensive. In this case, the owner knows that they are in violation but do not make the required repairs or corrections. What many of these occupancies did not know was that fire code violations were actually violations of the law and subject to fines.

This researcher conducted an interview with a general business license consultant. The consultant interviewed stated that complying with the stringent fire code requirements made it difficult to comply in addition to the costs associated with upgrades required (J. G. Garcia, personal communication, July 16, 2012). Garcia further stated that some business owners try to take shortcuts even after being informed by him of fire code requirements (J. G. Garcia, personal communication, July 16, 2012). Mr. Garcia added that another reason some of his clients are not meeting fire code requirements are due to conflicting requirements from the various government regulatory agencies (J. G. Garcia, personal communication, July 16, 2012).

One laundromat owner, who wished to remain anonymous, was interviewed by this researcher. He stated that he did not know all the requirements and failed numerous fire code inspections even after being provided a checklist. The laundromat owner further stated that the checklist provided was not detailed enough and too complicated.

A restaurant owner interviewed, who wished to remain anonymous, stated that the cost for installing a commercial cooking extinguishing system was too high. The restaurant owner further added that he was getting different requirements from other regulatory inspection agencies such as the Guam Department of Public Health.

John Robison a licensed fire protection contractor interviewed stated that many restaurant owners only want to comply with fire code regulations just to obtain fire department clearance in order to obtain a business license (J. I. Robison, personal communication, August 20, 2012). Robison (2012) stated that the two main reasons for businesses not complying were money and not knowing the requirements. Robison (2012) stated that most of these business owners came from countries that did not have the same type of fire code enforcement as Guam and the United States. Robison (2012) indicated that 50% of the new installations of fire protection installed do not maintain their systems to include fire alarms, automatic extinguishing systems, and commercial cooking extinguishing systems. Robison (2012) stated that he always recommends to these businesses that they at least complete an annual inspection and testing of their fire protection systems but cannot force them to do so. Robison (2012) recommended that the fire department conduct more frequent inspections as a means to increase the maintenance of fire protection systems.

Mr. Michael G. Meno, Principal, Harry S. Truman Elementary School was interviewed on August 27, 2012. Mr. Meno stated that the Guam Department of Education does not maintain fire protection systems in his school because the systems need to be retrograded (M. G. Meno, personal communication, August 27, 2012). He further stated that fire alarm repair and replacements, to include portable fire extinguishers, were not appropriated and allocated for in the school budget (M. G. Meno, personal communication, August 27, 2012).

To address these fire code issues and minimize fire hazards, Mr. Meno stated that he has implemented a school “Teacher Fire Code Checklist” (M. G. Meno, personal communication, August 27, 2012). Meno stated that his school’s “Teacher Fire Code Checklist” addresses hazards such as maintenance of egress, flammable materials storage, and hazards associated with art supplies (M. G. Meno, personal communication, August 27, 2012). Mr. Meno added that funding from the American Recovery and Reinvestment Act (AARA) has been identified to repair the schools fire alarm system (M. G. Meno, personal communication, August 27, 2012).

In summary, reasons for not maintaining fire code requirements vary from lack of knowledge of requirements to high cost of maintenance. However, interviews have indicated that some building owners are intentionally trying to take shortcuts and are knowingly avoiding compliance. In some cases, violators of the fire code did not know that they were actually violating the law versus violating a rule.

Fire Code Violations More Likely To Occur Than Others

From January 1, 2012 through July 31, 2012 a total of 87 inspections were conducted on existing occupancies (Guam Fire Department Fire Prevention Bureau, 2012). The violations most likely to occur were discrepancies on fire protections systems such as fire alarms, sprinklers, and commercial cooking extinguishing systems (Guam Fire Department Fire Prevention Bureau, 2012). Other major violations included electrical hazards such as unauthorized and permanent use of extension cords, maintenance of egress components, expired or no portable fire extinguishers, lacking required permits, and housekeeping (Guam Fire Department Fire Prevention Bureau, 2012).

Other communities throughout the nation replied to questionnaires with similar responses. The Honolulu Fire Department, Oahu, Hawaii indicated that the violations most likely to occur were fire alarm systems, fire protection appliances, egress, and electrical (Bratakos, 2012, p. 1). The Maui Fire Department, Maui, Hawaii indicated improper use of extension cords, unlit exit signs and broken emergency light fixtures, expired portable fire extinguishers, and discrepancies with commercial cooking extinguishing systems (Haake, 2012, p. 1). These types of findings were not unique to island fire departments.

Fire departments in the United States mainland reported similar findings. The Pitman Fire Department, Pitman, New Jersey indicated that discrepancies on annual servicing on portable fire extinguishers and inoperative exit/egress lighting were common (Pierson, 2012, p. 1). Also from New Jersey, the Burlington Township Fire Department indicated that discrepancies on annual servicing of portable fire extinguishers, obstructed means of egress, and issues with emergency and exit lights were more likely to occur (Tomaszewski, 2012, p. 1). The City of Newburgh Fire Department, New York, indicated that violations more likely to occur were discrepancies with means of egress and fire safety equipment (Horton, 2012, p. 1). In California, the San Ramon Valley Fire Protection District stated that sprinkler violations were most noted violations (Jamison, 2012, p. 1). The City of Dallas Fire Department indicated that violations more likely to occur were discrepancies with apartment smoke detectors, fire alarms, and sprinkler systems (Marsh, 2012, p. 1). The Dallas Fire Department also indicated discrepancies with assembly occupancies such as inoperative or unserviced fire alarm and sprinkler systems, locked or obstructed exits, exposed electrical wiring, and use of extension cords for permanent wiring (Marsh, 2012, p. 1).

The Federal Fire Department at Andersen Air Force Base, Guam did not indicate any problematic occupancies on base as compared to the local community. The violations most likely to occur that were indicated included housekeeping practices, storage issues, and discrepancies with portable fire extinguishers (Rios, 2012, p. 1).

In summary, it is clear that the fire code violations most likely to occur that the community of Guam face are not unique to this area of the world. Other island fire departments such as Oahu and Maui are very similar. Additionally, fire departments from the East Coast to the West Coast of the United States mainland report the same or similar violations that are likely to occur. It is interesting to learn that military base governments do not share the same violations.

PROCEDURES

Research Proposal

The procedures conducted for this applied research project began with the research proposal. This researcher decided to conduct an applied research project that would benefit the community of Guam directly linked with his assignment as the Fire Marshal of the Guam Fire Department. The research topic also had to be related to the *Executive Development* course of instruction at the National Fire Academy.

Problem Identified

The problem was identified based on this researcher's experience with problematic fire inspections, especially with existing occupancies that were observed to have been constantly disapproved by FPB inspectors. The problem is many of the occupancies on Guam do not maintain fire code requirements after their initial Guam Fire Department (GFD) fire code

inspections. The decision was made to conduct a research in order to identify recommendations for occupancies on Guam to maintain fire code requirements after initial fire code inspections by the Guam Fire Department.

Literature Gathering and Resources

This researcher began this project by searching and reviewing literature related to the topic at the Learning Resource Center, National Fire Academy to include online research. The main topics that this researched looked for were in the areas of fire code inspection, fire prevention, and fire code compliance. However the main focus of this researchers procedures were on answering the research questions utilizing the “Descriptive Research Method” (United States Fire Administration, 2011, p. SM 1-21).

Upon returning to the island of Guam, this researcher began gathering all materials from his personal library regarding the topic of fire inspection, code enforcement, and fire prevention. This reseacher then proceeded to the University of Guam (UOG) and established a library card account for use of the UOG library. This researcher found that the UOG library had very limited information regarding the research topic. However, this researcher found that with the library account, he was able to access information and journals via the online databases which the UOG library had. This researcher found that this would be a valuable research tool for future Executive Fire Officer projects.

This researcher also proceeded to the Guam Territorial Law Library to review archives of historical legal and fire service documents. This was useful in obtaining the history of the fire service on Guam and in gathering archived historical Executive and Legislative materials and information.

Fire Department Regulations and Review of GFD Fire Inspection Reports

This researcher also began gathering GFD General Orders, policies, procedures, and memorandums to be reviewed for information relative to fire inspections and code enforcement. In addition to these documents, this researcher began manually compiling data from inspection reports to be analyzed and interpreted for the purpose of this research. Because of time limitations and the lack of computer database system, this researcher decided to start analyzing inspection reports completed from January 1, 2012 through July 31, 2012 in addition to limited statistical information compiled by the FPB from the year 2011.

Questionnaires to Fire Inspection Applicants

This researcher also formulated questionnaires for applicants of fire inspections. The questionnaire was intended to assess fire inspection applicants of their knowledge of fire safety and fire code requirements. This researcher would then compare the information from the questionnaire with actual findings documented in fire inspection reports. The questionnaire was given to randomly selected citizens applying for a fire inspection from April 19, 2012 to May 16, 2012. A copy of this questionnaire is included in Appendix A of this report.

Questionnaires to other Fire Departments and Jurisdictions

A memo and questionnaire was also developed and emailed to 52 fire departments from other islands and throughout the United States mainland. This questionnaire was designed to assess the commonalities and differences of fire code discrepancies as well as challenges, operations, and recommendations that other subject matter experts in this field may have. A copy of the memo emailed to these departments is included in Appendix B of this report. A copy

of the questionnaire emailed to fire departments from other islands and the United States is included in Appendix C of this report.

Interviews

Interviews were conducted with leadership from other fire departments on the island, business owners, a fire protection contractor, a school principal, and a business consultant. This was done to gather information and perspectives from other parties of interest and stakeholders. An interview was also conducted with the President of the Western Pacific Islands Fire Chiefs Association to gather input and recommendations from the leadership of this fire service organization in the Pacific region.

Limitations Encountered

This researcher encountered many limitations when conducting this research project. Due to lack of data collection software, this researcher had to manually go through fire inspection reports and other fire department records. Due to limitations on time and the manual process of reviewing the FPB fire inspection reports and records, this researcher decided to review inspection records from January 1, 2012 to July 31, 2012.

This limitation was the same for many other local government agencies who did not have readily available reports for review. Many of Guams historical records regarding the fire service are not readily available and requires extensive investigations and review of archived records. This emphasized the importance of efficient data collection and storage of information for later retrieval.

Due to Guam's time difference from the rest of the United States and location in the Pacific Ocean. Making direct telephone calls to the United States mainland is expensive. This was one of the main reasons for this researcher's dependence on emailing questionnaires to other departments for information gathering.

Although, questionnaires were emailed to approximately fifty-two fire departments from other islands and from other parts of the United States mainland, only eight fire departments/jurisdictions replied. However, from the eight that replied, it appears that many of the fire departments with fire prevention functions appear to have limited personnel assigned to conduct fire prevention taskings.

Libraries on Guam are limited on reference materials and books on topics regarding the fire service and fire code enforcement. This researcher resorted to his personal library, ordering books with personal funds from abroad, and the use of limited GFD FPB fire code reference materials.

This researcher was limited on interviewing business and owners of the various occupancies. Due to the researchers position as the Fire Marshal on Guam, many business owners, employees, and tenants of the various occupancies were hesitant to be interviewed or wished to remain anonymous. This was possibly due to fear of exposing potential fire code violations and getting in trouble with upper management of their respective organization.

RESULTS

Based on the procedures conducted, this researcher was able to answer the four research questions. Various aspects of the procedures contributed to answering more than one question.

Research Question 1: How are other fire departments in other communities having their occupancies maintain fire code requirements?

A questionnaire (see Appendix C) was emailed to fifty-two fire departments from other islands and around the United States. Of the fifty-two, eight fire departments replied. Based on the questionnaire emailed, this researcher received various responses from the use of public education, participation in economic development committees, administrative citations, as well as through the use of financial consequences to be an effective means of gaining compliance. The following (Table 1) is a summary of questionnaire number 9 “Does your jurisdiction have any successful programs that assist in ensuring compliance with your fire code?”

Table 1

Does Your Jurisdiction have any successful programs that assist in ensuring compliance with your fire code?

Fire Department/Jurisdiction	Summary of Response
Andersen Air Force Base Fire Department, GU	When discrepancies are not corrected, commanders are informed. Facility managers answer to commanders.
Burlington Township, NJ	Penalties, violators are given time extensions and assistance if requested by the business.
San Ramon Valley Fire Protection District, CA	Administrative Citation program is an effective tool.
City of Dallas, Texas	Has a schedule for inspecting the various types of occupancies. Due to staffing levels unable to fully meet the schedules. Provides fire safety and injury prevention training presentations to the community and businesses upon request. Provides free smoke detector program to install smoke detectors in homes. Last fiscal year was a record low of 7 fire deaths.

Honolulu Fire Department, HI	Programs based on consulting and education. Call ahead of inspections and provides handouts of the inspection process and fire code violations to be checked. Encourages customers to take positive steps toward compliance.
Maui Fire Department, HI	No programs in place. Goal is to provide public education. Finds that people are more inclined to comply if they know the reasons fire codes exist and is for their good.
City of Newburg, NY	Compliance program dependent heavily on financial consequences for non-compliance.
Pitman Fire Department, Pitman, NJ	At least annually attend meeting with local chamber of commerce to educate business people on code enforcement. Answers code issues at the local economic development committee before fire code issues happen and to provide input on proposed projects.

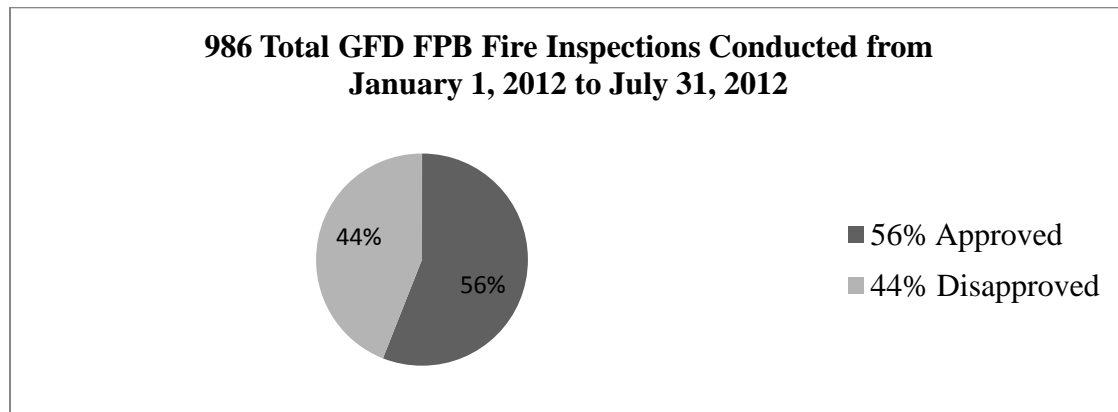
Source: Questionnaire emailed to other fire departments from other islands and the United States

Research Question 2: What are the occupancies on Guam that are problematic and not maintaining fire code requirements?

This researcher compiled data from the GFD FPB reports from January 1, 2012 through July 31, 2012. This researcher found a total of 986 fire inspections were conducted for this period. 986 is the total number for all fire inspections conducted to include permit inspections, new occupancies, complaints, as well as existing occupancies. Of the 986 fire inspections conducted for this period, 44% or 443 fire inspections were disapproved for fire code violations as depicted in Chart 1.

Chart 1

Total Fire Inspections Conducted: Approved and Disapproved

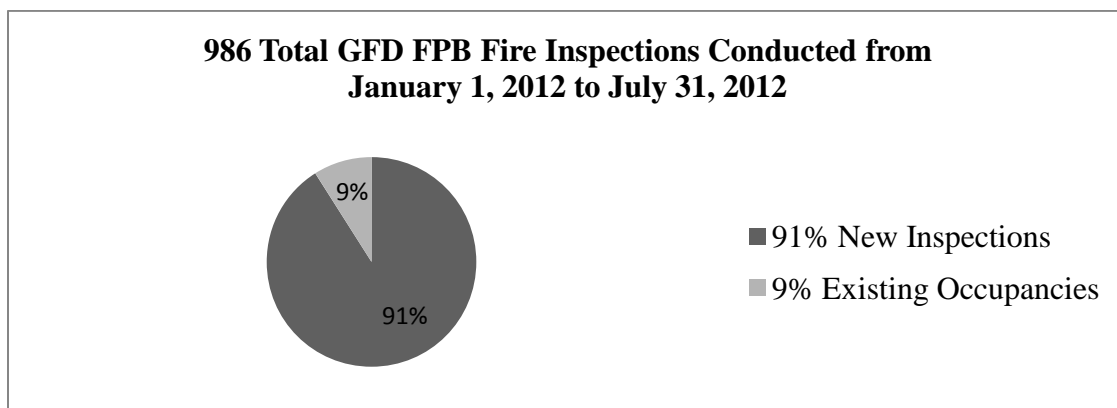


Source: GFD FPB Fire Inspection Reports January 1, 2012 to July 31, 2012

However, the focus of this research is on existing occupancies not maintaining fire code requirements after the initial fire code inspection conducted by the FPB. Of the 986 inspections conducted during this period, this researcher found 9% of the total inspections to be of existing occupancies or a total of 87 fire inspections as shown in Chart 2.

Chart 2

Total Fire Inspections Conducted: New and Existing Occupancies

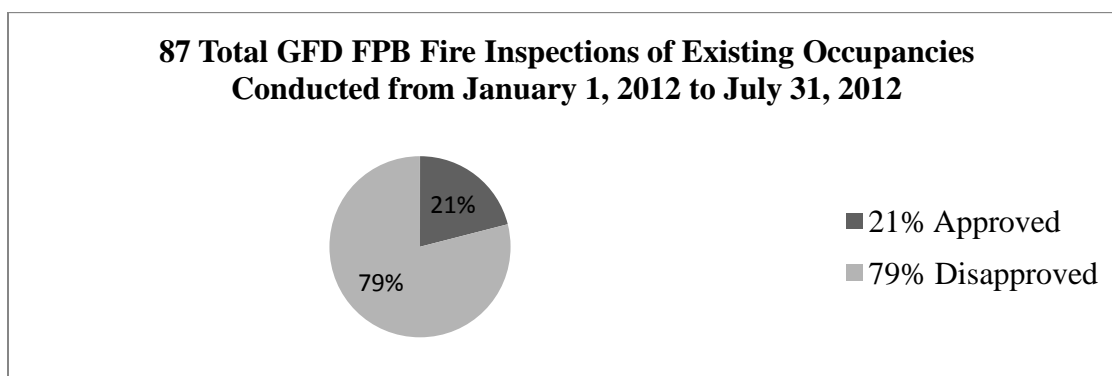


Source: GFD FPB Fire Inspection Reports January 1, 2012 to July 31, 2012

Of these 87 inspections of existing occupancies inspected by the FPB from January 1, 2012 through July 31, 2012, this researcher found that 79% or 69 of these inspections were disapproved for fire code violations as depicted in Chart 3.

Chart 3

Total Existing Occupancy Fire Inspections Conducted: Approved and Disapproved



Source: GFD FPB Fire Inspection Reports January 1, 2012 to July 31, 2012

The existing occupancies that were inspected and found to be problematic are summarized in Table 2.

Table 2

Occupancy Classification Percentage of the 69 Existing Occupancies Disapproved

Occupancy Classification	Percentage (of 69 disapproved)
Group A	51%
Group B	16%
Group E	3%
Group H	1%
Group I	3%
Group M	13%
Group R1	13%

Source: FPB Fire Inspection Reports January 1, 2012 to July 31, 2012

Question 3: Why are occupancies on Guam not maintaining fire code requirements?

In order to answer this question, this researcher conducted interviews of stakeholders and parties of interest in order to get a perception as to why occupancies were not maintaining fire code requirements after the initial fire code inspection by the FPB. Table 3 summarizes the findings of these interviews.

Table 3*Why don't you maintain fire code requirements?*

Title of Interviewee	Summary of Response
General Business License Consultant	Stringent fire code requirements. Costs associated with compliance. Conflicting requirements with other regulatory agencies.
Laundromat Owner	Did not know all requirements. Fire inspection checklist provided by the fire department was not detailed enough.
Restaurant Owner	Cost of installing a commercial cooking extinguishing system was too high. Was getting different requirements from other regulatory agencies such as Guam Department of Public Health.
Fire Protection Contractor	Many restaurants only comply to pass the initial fire department inspection and purposely do not maintain their systems due to associated costs. Many do not know the fire code requirements especially those business owners who come from foreign countries. Lack of frequent GFD FPB inspections of existing occupancies.
Elementary School Principal	Budget not allocated and appropriated for maintenance, repair, or replacement of fire protection systems to include portable fire extinguishers

Source: Interviews with occupancy owners and stakeholders

This researcher distributed surveys/questionnaires to occupancy owners applying for fire inspections. A total of 57 applicants participated. This survey is intended to gauge perceptions and knowledge of fire protection and safety. A copy of the questionnaire is included in Appendix A. Table 4a and 4b summarizes the findings.

Table 4a

Summary of Fire Protection Survey for Businesses/Occupancies on Guam

When was the last time you had a fire inspection?	
Within the last year	46%
Over 1 year	18%
Over 5 years	3%
Do not remember	11%
Has not had an inspection since opening the business	23%

Source: GFD FPB Fire Protection Survey for Businesses/Occupancies on Guam

Table 4b

Summary of Fire Protection Survey for Businesses/Occupancies on Guam

Question	%Yes	% No
Are you familiar with fire safety?	88%	12%
Do you have a portable fire extinguisher for your business?	91%	9%
Do you know how to inspect a portable fire extinguisher?	65%	35%
Do you have smoke detectors at work or home?	96%	4%
Do you know how to inspect a smoke detector?	67%	33%
Do you know if you have adequate exits?	86%	14%
Do you know how to maintain adequate exits?	88%	12%
Do you maintain your sprinkler system according to the fire code? (applicable to 44)	48%	52%
Do you maintain your fire alarm system according to the fire code? (applicable to 44)	66%	34%
Do you welcome an unannounced fire inspection by the fire department?	86%	14%
Do you feel that maintaining fire protection is too costly?	32%	68%
Do you have fire insurance?	65%	35%
Please write any additional comments.	12% provided some comments	

Source: GFD FPB Fire Protection Survey for Businesses/Occupancies on Guam

Question 4: What violations are more likely to occur than others?

To answer this question, this researcher reviewed the inspection reports of the 69 existing occupancies which failed fire code inspections conducted by the FPB. Table 5 describes the percentage of violations based on the 69 existing occupancy inspections that were disapproved.

Table 5

Major Violation Most Likely to Occur	Violation Percentage (of the 69 Existing Occupancies Disapproved)
Fire Protection Systems	75%
Maintenance of Means of Egress	36%
Electrical Hazards	61%
Portable Fire Extinguishers	57%
Permit Violations	38%
Housekeeping	29%

Source: FPB Fire Inspection Reports January 1, 2012 to July 31, 2012

DISCUSSION

The purpose of this applied research project was to identify recommendations for occupancies on Guam to maintain fire code requirements after their initial fire code inspections by GFD. In order to identify recommendations, this researcher had to answer four research questions: (a) How are other fire departments in other communities having their occupancies maintain fire code requirements?, (b) What are the occupancies on Guam that are problematic and not maintaining fire code requirements?, (c) Why are occupancies on Guam not maintaining fire code requirements?, and (d) What violations are more likely to occur than others?

Fire departments throughout the world apply some aspects, in one form or another, of the “five “E”s” to include “education, enforcement, engineering, emergency response, and economic incentives” mentioned in the NFPA *Fire Protection Handbook* (Kirtley, 2008, p. 12-310). Many fire department organizational structures are designed to address these “five “E”s” and the fire

safety needs of the community by establishing organizational bureau or division functions such as fire suppression, emergency medical services, fire prevention, and training.

However, it is more evident now that most, fire departments and jurisdictions must evolve and become more creative in finding ways to address the “adaptive challenges” (Heifetz & Linsky, 2002, p. 13) that they face in order to accomplish their mission under adverse economic conditions. Faced with budgetary cuts, staffing shortages, and other unfunded requirements, the fire service is more than ever required and expected to do more with less. In many cases, fire departments such as GFD attempts to focus on the basic requirements of fire suppression and emergency medical services. Measuring effectiveness and accurate record keeping of fire prevention activities is critical especially for budget justification.

“Inability of fire officials to demonstrate the value of committing some additional community resources to the broad range of possible prevention activities may well result in a withdrawal of resources from prevention programs and a subsequent increase in the need for a much larger suppression budget” (Granito, 1997, p. 10-35).

However, this comes at a price to the community and is evident in other bureau functions that become unintentionally neglected such as the FPB.

This price in the case of the GFD FPB is the high fire code violation rate. The 44% disapproval rate of all fire inspections conducted by the GFD FPB from January 1, 2012 through July 31, 2012 and the 79% disapproval rate of existing occupancies is alarming (Guam Fire Department Fire Prevention Bureau, 2012). These findings are evidence that there exists a high fire hazard which if goes unchecked will result in an increased number fires and potential loss of life. *THE FIRE CHIEF’S HANDBOOK* discusses the “fire solution” triangle consisting of

“response”, “public safety education”, and “ codes/enforcement/technology” as the “three elements” of “fire service operations” (Nachbar, 1995, p. 1074). “If you take any one of these three elements away from the fire service operations, you will never stop fires, deaths, or injuries in your community” (Nachbar, 1995, p. 1074).

The low number of fire code inspections on existing occupancies appears to be a factor in the high failure percentage rate. After analyzing the data of the fire code inspections conducted, it is further evident that occupancies are not maintaining fire code requirements after their initial fire code inspections. Of the 986 fire inspections conducted from January 1, 2012 through July 31, 2012, only 9% or 87 of these inspections were for existing occupancies (Guam Fire Department Fire Prevention Bureau, 2012). It is possible that the occupancy owners and tenants may be neglecting their buildings and the fire protection systems due to the low number of existing occupancy fire inspections conducted by the FPB.

Adding to the low number of existing occupancy inspection as a factor is the business license renewal process with the Guam Department of Revenue and Taxation (DRT). Business owners merely renew their licenses every year without having a fire inspection by the FPB. The fire code inspection is only required by DRT for the initial business license application. Annual business license renewals required by the Guam DRT do not include a GFD FPB fire code inspection. It appears that this may be a contributing factor as to why many occupancy owners lose the incentive to continue maintaining fire code requirements after the initial fire code inspection.

The most problematic occupancies inspected were found to be the assemblies to include restaurants with the majority of the discrepancies or violations being fire protection systems,

electrical hazards, maintenance of means of egress, and discrepancies with portable fire extinguishers (Guam Fire Department Fire Prevention Bureau, 2012). This problem is not only the fire department's problem but the entire community's problem as well. In many cases, cost becomes an issue for the occupancy to come to compliance. "Some costs that are beyond the public's willingness to bear may be transferred to the private sector (as when buildings over a certain size or height or with a certain occupancy are required to have automatic extinguishing systems)" (Granito, 1997, p. 10-40).

With Guam being primarily dependent on tourism, and support of the military in the region, it is critical that fire safety be prioritized if the island is to be marketed as a tourism destination and used to house military members and dependents. The local community must also understand that maintenance of fire code requirements is for their safety as well. The local community is the largest patrons of these existing facilities and buildings found to be in violation of the fire codes. The entire community is the largest stake holder and will suffer the most in the event of a fire or tragedy resulting from these fire hazards found by the FPB. Education and community participation is important so that members of the community may have an increased sense of ownership of the problem and assist in mitigating these fire hazards. "Social marketing techniques appear to have the greatest likelihood for success on fire issues since they seek to change the way people think and make decisions" (United States Fire Administration, 2000, p. 24). Much of the public education and community engagement though rests with the FPB inspectors.

"The fire inspector is the key to the community's fire reduction program" (Sawyer, 2002, p. 3). The shortage of personnel with the Guam Fire Department and with the Fire Prevention Bureau is now hampering the FPB's ability to keep up with inspections of existing occupancies

after they received their initial fire code inspection. “Fire inspection is the means of discovering and eliminating or correcting deficiencies that pose a threat to life and property” (Sawyer, 2002, p. 3). The Guam Fire Department must evolve to address the shortage of FPB inspectors and mitigate the fire hazards that exist in the community.

Based on the Fire Protection Survey for Businesses/Occupancies on Guam summarized in Table 4a and Table 4b, it appears that although 88% of fire inspection applicants believe they know about fire protection and fire safety, they actually may not be as knowledgeable as they perceive themselves to be. This is based on the 44% overall disapproval rate for fire code violations and 79% disapproval rate for existing occupancy fire inspections. It appears that most applicants wish the FPB inspector, who is setting up the inspection schedule, to believe that they are ready for a fire inspection so that they may secure an earlier inspection date when applying for an inspection. Adding to this is the only penalty for failing an initial fire inspection is a \$30 re-inspection fee. Some applicants appear to think that it is worth spending \$30 for the fire department to tell them what they need in order to pass a fire inspection.

Based on this research, it appears that the violations of the fire code most likely to occur as shown in Table 5 are related to fire protections systems, electrical hazards, means of egress, portable fire extinguishers, and housekeeping. Many building owners and businesses may be neglecting their occupancies unintentionally without knowing the consequences. In some cases, this researcher in the capacity of a fire investigator has responded to fires where the business owner did not have insurance coverage for their business. Additionally, this researcher found many fire code violations, while conducting fire investigations, in many facilities and building involved in fires. In some cases neighboring occupancies went out of business as a result of fire spreading to their business space and not being able to recuperate due to lack of insurance

coverage. These fire hazards or fire code violations when unchecked have a disastrous chain reaction on other businesses and the community. An increased presence will have positive effects on the community's knowledge of fire safety, the mission of the FPB, and overall reduction of fire hazards.

RECOMMENDATIONS

The purpose of this applied research project was to identify recommendations for occupancies on Guam to maintain fire code requirements after initial fire code inspections by GFD. After answering the research questions, review of subject related literature, and consulting and gathering information from stake holders and other subject matter experts from the fire service from other islands and throughout the United States, this researcher has identified collective recommendations for occupancies to maintain fire code requirements after the initial fire code inspection.

First, this researcher recommends the Guam Fire Department increase its presence in the community with the use of Fire Suppression Personnel for fire code inspections. This recommendation was made after consulting with GFD Fire Chief Joey C. San Nicolas. San Nicolas stated that, "maximizing the use of fire suppression personnel for fire inspections will increase visibility of the fire department in the community and assist fire prevention personnel in identifying fire code violations" (J. C. San Nicolas, personal communication, August 31, 2012). "Fire suppression personnel can perform routine inspections on a regular basis within their first-due response area, and designated fire prevention personnel, where available, can perform follow-up inspections, enforcement, and special technical inspections" (Carter & Rausch, 1999, p. 120). Fire Suppression officers also benefit as, "fire prevention can provide meaning and

greater job satisfaction to a company, especially one that fights fires only infrequently” (Carter & Rausch, 1999, p. 152). Additionally, San Nicolas supports empowering GFD fire company officers to issue citations and fines for violations of the Guam Fire Code (J. C. San Nicolas, personal communication, August 31, 2012). However, the citation program for GFD was implemented on June 2012 by the FPB and is currently under development. These measures will prove to be beneficial especially in light of budget cuts and shortage of personnel assigned to the Fire Prevention Bureau.

Second, recommend an increase in a public education campaign with the use of government agencies and private organizations such as the Guam Visitors Bureau, the Guam Hotel & Restaurant Association, Guam Education Policy Board, Guam Building Code Council, and the Village Mayors Council. Public Education has been traditionally geared towards Fire Prevention Week on Guam. Public education needs to be year round in order to be successful. The program needs community support and commitment. Owners and tenants of the various occupancies must understand the reasons for fire safety and how compliance with the fire code is in their best interest. Assistant Chief Stanley Torres, President of the Western Pacific Fire Chiefs Association, stated that, “fire prevention awareness should be promoted year round, being the good guy instead of the bad inspector makes a big difference” (S. C. Torres, personal communication, June 18, 2012). Torres added, “conduct courtesy visits to help facility managers and owners meet compliance without fear of getting written up or paying a fine” (S. C. Torres, personal communication, June 18, 2012). Public education involves establishing rapport and trust from the community.

Third, recommend a more aggressive campaign for citing and imposing fines for repeat violators of the fire code. Perhaps, working with the media to publicize the number of violators

fined for violations of the fire code on a regular basis and the reasons for the citations and fines would act as a deterrence to non compliance and as an incentive to maintain fire code requirements.

And fourth, recommend a requirement for all occupancies to have an annual clearance from the FPB for business license renewals. This would require the Guam Department of Revenue and Taxation to include the FPB in their checklist for business license renewals. By doing so, there would be a greater incentive to maintain fire code requirements. As part of this annual clearance, the FPB could provide self inspection checklists for businesses renewing their licenses to ensure that they are in compliance. This would also serve as a means for annually renewing required operations permits if applicable. Further coordination with the DRT would be required to implement this recommendation.

Implementation and execution of these recommendations may have a positive effect on occupancies maintaining fire code requirements after the initial fire code inspection conducted by the GFD FPB. However, further follow up studies will have to be conducted to determine the effectiveness of these recommendations after implementation and execution.

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Appendix A**DATE:**_____**FIRE PROTECTION SURVEY FOR BUSINESSES/OCCUPANCIES ON GUAM****Occupancy Classification:**_____

THANK YOU FOR COMPLETING THIS SURVEY. INFORMATION GAINED WILL BE USED TO BETTER SERVE OUR COMMUNITY.

INSTRUCTIONS: CIRCLE APPROPRIATE ANSWER. YOUR RESPONSE WILL REMAIN ANONYMOUS.

When was the last time you had a fire inspection?

- a. Within the last year
- b. Over 1 year
- c. Over 5 years
- d. Do not remember
- e. Has not had a fire inspection since opening the business

Are you familiar with fire safety? A. Yes B. No

Do you have a portable fire extinguisher for your business? A. Yes B. No

Do you know how to inspect a portable fire extinguisher? A. Yes B. No

Do you have smoke detectors at work or home? A. Yes B. No

Do you know how to inspect a smoke detector? A. Yes B. No

Do you know if you have adequate exits? A. Yes B. No

Do you know how to maintain adequate exits? A. Yes B. No

Do you maintain your sprinkler system according to the fire code? (If applicable) A. Yes B. No

Do you maintain your fire alarm system according to the fire code? (If applicable) A. Yes B. No

Do you welcome an unannounced fire inspection by the fire department? A. Yes B. No

Do you feel that maintaining fire protection is too costly? A. Yes B. No

Do you have fire insurance? A. Yes B. No

Please write any additional comments:

Appendix B

Hafa Adai, Aloha, and Greetings,

My name is Captain Joey A. Manibusan. I am from the Fire Prevention Bureau, Guam Fire Department. I am a student with the Executive Fire Officer (EFO) Program, National Fire Academy and I am reaching out to you for the purpose of collecting data for an Applied Research Project. The information gained from this research will be used to help improve the Guam Fire Departments processes for fire inspections, fire safety in the community, and ultimately the fire service throughout the nation.

I humbly request that you complete the attached questionnaire regarding fire inspections conducted by your jurisdiction. I ask that if you do not have the requested information that you kindly forward the request to the appropriate section of your jurisdiction.

The results of my research will be made available to you upon request.

I wish to thank you in advance for your assistance. Please feel free to contact me if you have any further questions regarding this research project.

Very Respectfully,

//SIGNED//

JOEY A. MANIBUSAN

FIRE MARSHAL

GUAM FIRE DEPARTMENT

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Appendix C

Questionnaire emailed to other fire departments from other islands and the United States.

Name:
Title:
State/Jurisdiction:
Date:

1. What is the population served by your jurisdiction?
2. How many fire code enforcement inspections did your jurisdiction conduct from January 1, 2012 thru May 31, 2012?
3. How many of the above inspections failed or were disapproved?
4. How many of the above inspections were inspections of existing occupancies?
5. How many of the existing occupancy fire inspections that were conducted failed?
6. What was the occupancy group that tended to be problematic?
7. What violations were more likely to occur than others?
8. What types of penalties does your jurisdiction impose for failing an inspection?
9. Does your jurisdiction have any successful programs that assist in ensuring compliance with your fire code?

10. Does your jurisdiction have a Certified Fire Inspector Program in Place?
11. Does your jurisdiction have a self inspection program in place?
12. Please add any additional comments regarding your successes with ensuring fire code compliance in your community.